

WHAT IS CLAIMED IS:

1 1. A filter layer for a display, comprising:

2 oxide particles; and

3 nano-sized metal particulates adhered to a surface of the oxide particles with a surface plasma

4 resonance phenomenon being triggered at corresponding interfaces of the nano-sized metal

5 particulates and the oxide particles to selectively absorb light at least at one predetermined

6 wavelength of light.

1 2. The filter layer of claim 1, further comprised of a metal of the nano-sized metal

2 particulates being selected from the group consisting of a transition metal, an alkali metal, an alkali

3 earth metal and mixtures of any of a transition metal, an alkali metal and an alkali earth metal.

1 3. The filter layer of claim 1, further comprised of a metal of the nano-sized metal

2 particulates being selected from the group consisting of Au, Ag, Pd, Pt, Cu, Ni, Sb, Sn, Zn, Zr, Se,

3 Cr, Al, Ti, Ge, Fe, W, Pb and mixtures of any of Au, Ag, Pd, Pt, Cu, Ni, Sb, Sn, Zn, Zr, Se, Cr, Al,

4 Ti, Ge, Fe, W and Pb.

1 4. The filter layer of claim 1, further comprised of an oxide of the oxide particles being

2 selected from the group consisting of an oxide, a silica, a titania, a zirconia, an alumina and mixtures

3 of any of an oxide, a silica, a titania, a zirconia and an alumina.

1 5. The filter layer of claim 1, further comprised of an amount of the nano-sized metal
1 particulates being in range of from 0.001 to 0.5 mole percent on a basis of the oxide particles.

1 6. The filter layer of claim 1, further comprised of the nano-sized metal particulates each
2 being of a size within a range of greater than 1 nanometer but less than 1 micrometer in diameter.

1 7. A filter layer prepared by a process, the process comprising:
2 dispersing an oxide in water to form an oxide sol;
3 adding a metal salt, a reducing agent, and a dispersing agent to an organic solvent to prepare
4 a metal colloid solution;
5 mixing the oxide sol with the metal colloid solution to prepare a coating solution with a metal
6 colloid of the metal colloid solution being dispersed in the oxide sol;
7 applying the coating solution on a face panel of a display to form a filter layer; and
8 drying the filter layer at room temperature.

1 8. The filter layer prepared by the process of claim 7, further comprising controlling an
2 absorption intensity and absorption peak wavelength of light by adjusting at least one factor selected
3 from the group consisting of kinds, contents and size of metal particulates of the metal colloid
4 solution, and at least one factor selected from the group consisting of kinds and contents of oxide
5 particles of the oxide, prior to the step of mixing the oxide sol with the metal colloid solution.

1 9. A display, comprising:

2 at least one filter layer, the at least one filter layer comprising oxide particles and nano-sized
3 metal particulates adhered to surface of the oxide particles with a surface plasma resonance
4 phenomenon being triggered at corresponding interfaces of the nano-sized metal particulates and the
5 oxide particles to selectively absorb light at least at one predetermined wavelength of light.

1 10. The display of claim 9, further comprised of the display comprising a cathode ray tube,
2 comprising:

3 a face panel;
4 at least one filter layer formed on an inner surface of the face panel, the at least one filter
5 layer comprising oxide particles and nano-sized metal particulates adhered to a surface of the oxide
6 particles, the at least one filter layer providing at least one selective absorption peak for light at a
7 corresponding predetermined wavelength of light by induction of a surface plasma resonance
8 phenomenon at corresponding interfaces between the nano-sized metal particulates and the oxide
9 particles; and

10 a phosphor layer formed on a filter layer of the at least one filter layer.

1 11. The display of claim 10, further comprised of the at least one filter layer including a
2 plurality of kinds of metals and oxides for the nano-sized metal particulates and the oxide particles
3 to provide a plurality of differing selective absorption peaks for corresponding wavelengths of light.

1 12. The display of claim 10, further comprised of the at least one filter layer including a
2 plurality of filter layers each being formed to respectively provide a plurality of selective absorption
3 peaks for light at corresponding different wavelengths of light.

1 13. The display of claim 9, further comprised of the display comprising a cathode ray tube,
2 comprising:

3 a face panel;
4 at least one filter layer formed on an outer surface of the face panel, the at least one filter
5 layer comprising oxide particles and nano-sized metal particulates adhered to a surface of the oxide
6 particles, the at least one filter layer providing at least one selective absorption peak for light at a
7 corresponding predetermined wavelength of light by induction of a surface plasma resonance
8 phenomenon at corresponding interfaces between the nano-sized metal particulates and the oxide
9 particles; and

10 a phosphor layer formed on an inner surface of the face panel.

1 14. The display of claim 13, further comprised of the at least one filter layer including a
2 plurality of kinds of metals and oxides for the oxide particles and the nano-sized metal particulates
3 to provide a plurality of differing selective absorption peaks for corresponding wavelengths of light.

1 15. The display of claim 13, further comprised of the at least one filter layer including a

2 plurality of filter layers formed to respectively provide a plurality of selective absorption peaks for
3 light at corresponding different wavelengths of light.

1 16. The display of claim 13, further comprising a conductive film located between the outer
2 surface of the face panel and a filter layer of the at least one filter layer.

1 17. The display of claim 13, further comprised of the at least one filter layer providing an
2 anti-reflection layer.

1 18. The display of claim 9, further comprised of the display comprising a cathode ray tube,
2 comprising:

3 a face panel;

4 at least one first filter layer formed on an inner surface of the face panel;

5 at least one second filter layer formed on an outer surface of the face panel; and

6 a phosphor layer formed on a filter layer of the at least one the first filter layer, the at least
7 one first filter layer and the at least one second filter layer each comprising oxide particles and nano-
8 sized metal particulates adhered to a surface of the oxide particles, the at least one first filter layer
9 and the at least one second filter layer each providing at least one selective absorption peak for light
10 at a corresponding predetermined wavelength of light by induction of a surface plasma resonance
11 phenomenon at corresponding interfaces between the nano-sized metal particulates and the oxide
12 particles.

1 19. The display of claim 18, further comprised of any of the at least one first filter layer and
2 the at least one second filter layer including a plurality of metals and oxides for the oxide particles
3 and the nano-sized metal particulates to provide a plurality of differing selective absorption peaks for
4 corresponding wavelengths of light.

1 20. The display of claim 18, further comprised of any of the at least one first filter layer and
2 the at least one second filter layer including a plurality of filter layers formed to respectively provide
3 a plurality of selective absorption peaks for light at corresponding different wavelengths of light.

1 21. The cathode ray tube of claim 18; further comprising a conductive film located between
2 the outer surface of the face panel and a filter layer of the at least one second filter layer.

1 22. The cathode ray tube of claim 18, further comprised of the at least one second filter layer
2 providing an anti-reflection layer.

1 23. The display of claim 9, further comprised of the display comprising a plasma display
2 panel, comprising:
3 a rear substrate including a plurality of address electrodes disposed on the rear substrate, and
4 a first dielectric layer disposed on the rear substrate and covering the plurality of address electrodes;
5 a plurality of spacers disposed on the first dielectric layer, and adjacent ones of the plurality

6 of spacers being respectively positioned in opposing relation with respect to an address electrode of
7 the plurality of address electrodes to provide a corresponding discharge space;
8 a plurality of phosphor layers disposed on the first dielectric layer, each of the plurality of
9 phosphor layers being respectively formed in a corresponding discharge space provided by adjacent
10 ones of the plurality of spacers;
11 a front substrate including a plurality of scan electrodes and a plurality of common electrodes
12 disposed on the front substrate in a direction transverse to a direction of the plurality of address
13 electrodes;
14 at least one filter layer disposed on the front substrate and covering the plurality of scan
15 electrodes and the plurality of common electrodes, the at least one filter layer comprising oxide
16 particles and nano-sized metal particulates adhered to a surface of the oxide particles, the at least one
17 filter layer providing at least one selective absorption peak for light at a corresponding predetermined
18 wavelength of light by induction of a surface plasma resonance phenomenon at corresponding
19 interfaces between the nano-sized metal particulates and the oxide particles;
20 a second dielectric layer disposed on a filter layer of the at least one filter layer; and
21 a protective layer disposed on the second dielectric layer.

1 24. The display of claim 23, further comprised of the at least one filter layer including a
2 plurality of kinds of metals and oxides for the oxide particles and the nano-sized metal particulates
3 to provide a plurality of differing selective absorption peaks for corresponding wavelengths of light.

1 25. The display of claim 23, further comprised of the at least one filter layer including a
2 plurality of filter layers formed to respectively provide a plurality of selective absorption peaks for
3 light at corresponding different wavelengths of light.

1 26. The display of claim 9, further comprised of the display comprising a plasma display
2 panel, comprising:

3 a rear substrate including a plurality of address electrodes disposed on the rear substrate, and
4 a first dielectric layer disposed on the rear substrate and covering the plurality of address electrodes;
5 a plurality of spacers disposed on the first dielectric layer, and adjacent ones of the plurality
6 of spacers being respectively positioned in opposing relation with respect to an address electrode of
7 the plurality of the address electrodes to provide a corresponding discharge space;

8 a plurality of phosphor layers disposed on the first dielectric layer, each of the plurality of
9 phosphor layers being respectively formed in a corresponding discharge space provided by adjacent
10 ones of the plurality of spacers;

11 a front substrate including a plurality of scan electrodes and a plurality of common electrodes
12 disposed on the front substrate in a direction transverse to a direction of the plurality of address
13 electrodes, and a second dielectric layer disposed on the front substrate covering the plurality of scan
14 electrodes and the plurality of common electrodes;

15 at least one filter layer disposed on the second dielectric layer, the at least one filter layer
16 comprising oxide particles and nano-sized metal particulates adhered to a surface of the oxide
17 particles, the at least one filter layer providing at least one selective absorption peak for light at a

18 corresponding predetermined wavelength of light by induction of a surface plasma resonance
19 phenomenon at corresponding interfaces between the nano-sized metal particulates and the oxide
20 particles;

21 a third dielectric layer disposed on a filter layer of the at least one filter layer; and
22 a protective layer disposed on the third dielectric layer.

1 27. The display of claim 26, further comprised of the at least one filter layer including a
2 plurality of kinds of metals and oxides for the oxide particles and the nano-sized metal particulates
3 to provide a plurality of differing selective absorption peaks for corresponding wavelengths of light.

1 28. The display of claim 26, further comprised of the at least one filter layer including a
2 plurality of filter layers formed to respectively provide a plurality of selective absorption peaks for
3 light at corresponding different wavelengths of light.

1 29. The display of claim 9, further comprised of the display comprising a plasma display
2 panel, comprising:

3 a rear substrate including a plurality of address electrodes disposed on the rear substrate, and
4 a first dielectric layer disposed on the rear substrate and covering the plurality of address electrodes;
5 a plurality of spacers disposed on the first dielectric layer, and adjacent ones of the plurality
6 of spacers being respectively positioned in opposing relation with respect to an address electrode of
7 the plurality of address electrodes to provide a corresponding discharge space;

8 a plurality of phosphor layers disposed on the first dielectric layer, each of the plurality of
9 phosphor layers being respectively formed in a corresponding discharge space provided by adjacent
10 ones of the plurality of spacers;

11 a front substrate including a plurality of scan electrodes and a plurality of common electrodes
12 disposed on the front substrate in a direction transverse to a direction of the plurality of address
13 electrodes, and a second dielectric layer disposed on the front substrate covering the plurality of scan
14 electrodes and the plurality of common electrodes;

15 at least one filter layer disposed on the second dielectric layer, the at least one filter layer
16 comprising oxide particles and nano-sized metal particulates adhered to a surface of the oxide
17 particles, the at least one filter layer providing at least one selective absorption peak for light at a
18 corresponding predetermined wavelength of light by induction of a surface plasma resonance
19 phenomenon at corresponding interfaces between the nano-sized metal particulates and the oxide
20 particles; and

21 a protective layer disposed on a filter layer of the at least one filter layer.

1 30. The display of claim 29, further comprised of the at least one filter layer including a
2 plurality of kinds of metals and oxides for the oxide particles and the nano-sized metal particulates
3 to provide a plurality of differing selective absorption peaks for corresponding wavelengths of light.

1 31. The display of claim 29, further comprised of the at least one filter layer including a
2 plurality of filter layers formed to respectively provide a plurality of selective absorption peaks for

3 light at corresponding different wavelengths of light.

1 32. A method of preparing a filter layer, comprising:

2 dispersing an oxide in water to form an oxide sol;

3 adding a metal salt, a reducing agent, and a dispersing agent to an organic solvent to prepare

4 a metal colloid solution;

5 mixing the oxide sol with the metal colloid solution to prepare a coating solution with a metal

6 colloid of the metal colloid solution being dispersed in the oxide sol;

7 applying the coating solution on a face panel of a display to form a filter layer; and

8 drying the filter layer at room temperature.

1 33. The method of claim 32, further comprising controlling an absorption intensity and an

2 absorption peak wavelength of light by adjusting at least one factor selected from the group

3 consisting of kinds, contents and size of metals particulates of the metal colloid solution, and at least

4 one factor selected from the group consisting of kinds and contents of oxide particles of the oxide

5 prior to the step of mixing the oxide sol with the metal colloid solution.